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[57] **ABSTRACT**

A magnetically-driven pump transferring fluid through a conduit is provided, having an electromagnet assembly selectively excited by a power source, and a non-ferromagnetic lever structure extending from the electromagnet assembly to the conduit, the lever structure having a ferromagnetic portion, which may consist of a plate, at one end movable by the electromagnet assembly between a release position where the ferro-magnetic portion is angularly offset relative to the electromagnet assembly and a compression position where the ferro-magnetic portion is in substantially parallel contact with the electromagnet assembly, the ferromagnetic portion enabling a striker portion at another end of the lever structure to compress the conduit at a predetermined frequency. The lever structure couples movement of the ferro-magnetic portion at one end with movement of a striker at the other end such that the ferro-magnetic portion moves within a lesser arcuate range and the striker moves within a greater arcuate range. To reduce operating noise, the lever may be pivotally mounted on a translating shaft, enabling a part of the ferro-magnetic portion to remain in contact with the electromagnet assembly while in and between the release and compression positions.

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[52] U.S. Cl. 417/412

[58] **Field of Search** 417/410.1, 412,
417/322, 505: 604/67, 153

[56] **References Cited**

U.S. PATENT DOCUMENTS

Re. 26,509	12/1968	Walton	417/412
2,816,514	12/1957	Freese	417/412
3,005,313	10/1961	Carlson	416/322
3,171,360	3/1965	Walton	417/412
3,518,033	6/1970	Anderson	417/478
4,014,318	3/1977	Dockum et al.	417/412
4,140,121	2/1979	Kuhl et al.	604/891.1
4,140,122	2/1979	Kuhl et al.	604/890.1
4,443,216	4/1984	Chappell	417/412
4,501,405	2/1985	Usry	417/412
4,565,497	1/1986	Müller et al.	417/412
5,286,176	2/1994	Bonin	417/322

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20 Claims, 2 Drawing Sheets

